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making; and chapter 15 to the rôle of amylase in the distillery. Much attention is also devoted to methods of determining the activity of enzymes, to which Effront himself has contributed greatly, as indeed he has to the whole subject.

Three enzymes are considered in great detail, namely, sucrase (invertase), amylase (diastase), and maltase. The most important industrial applications of maltase seem to be in the manufacture of various oriental beverages.

In several inductory chapters the author discusses the general properties, the mode of action, and the individuality of enzymes. For the general reader or the physiologist these chapters will be found the most useful. The translator adheres to the author's use of the term diastase in its general sense as a synonym of enzyme. In view of the very wide application of the word diastase to a particular group of enzymes this usage may lead to confusion. In general the translation is satisfactory, though the choice of words is not always happy, and the paragraphing might have been greatly improved upon. At the close of each chapter there is a bibliography. The incompleteness of the citations and the diverse forms used will be a source of annoyance to anyone attempting to look up references. The translator could have done good service to English readers by adopting some consistent plan of citation and supplementing the author's bibliographical work.

This book will be certain of comparison with Green's recent work on the *Soluble ferments and fermentation*. The two are written from a wholly different standpoint; in Green's work the industrial applications are only incidentally touched upon, but in those portions where comparison is possible it will hardly be to the advantage of the Effront book. The latter produces an impression of fragmentariness and incompleteness, and there is a lack of finish, all of which leave the reader without a clear-cut impression. This is no doubt due in part to the incompleteness of the subject, for in reality much remains to be discovered regarding these bodies, but part of the result named must be ascribed to the work of the author and translator.

The book, however, will be extremely useful to schools and individuals concerned with the industrial processes of baking, malting, brewing, distilling, etc., in which fermentation plays so important a part.—C. R. BARNES.

Outlines of botany.[4]

MR. LEAVITT has prepared, at the request of the botanical department of Harvard Universty, a text-book of botany for secondary schools, based upon and evidently intended to replace Gray's *Lessons in botany*, which, even in its revised form, is growing less and less acceptable. An endeavor has been made, according to the author's statement, to provide for the "many schools which, having outgrown certain now antiquated methods of teaching botany, find the best of the more recent text-books too difficult and comprehensive for practical use in an elementary course. . . . . The descriptive text follows in the main the sequence of topics of Gray's *Lessons in botany*, and certain parts of that book have been retained. . . . . The writer has felt free to adopt the phraseology of Dr. Gray wherever desired, without quotation marks. . . . . But the greater part of the descriptive text throughout is new, the chapters on cryptogams and on physiology being entirely so."

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[4] LEAVITT, ROBERT GREENLEAF, Outlines of botany, for high-school laboratory and class room, based on Gray's *Lessons in botany*. Prepared at the request of the botanical department of Harvard University. 8vo. pp. 272. *figs. 383*. New York: American Book Company. 1901. Also, combined with *Field, forest and garden botany*.

Mr. Leavitt's own part of the book is fresh, well chosen, and clear, with hardly more than that seemingly irreducible minimum of error to be found in all elementary books. Especially noticeable is the position and character of the laboratory directions, which precede the text on each topic. Besides the section on cryptogams, of fifty-five pages, eighteen pages are devoted to the minute anatomy of flowering plants, and twenty-one to a "brief outline of vegetable physiology." Many of the illustrations are from the admirable drawings made for the *Lessons* and *Structural botany*, and a large number of new ones are introduced, which are both well chosen and well executed.

It will be clear, however, to anyone who considers the laboratory directions that there is much more work laid out, especially in the sections on "cryptogams," than can possibly be accomplished, even in a year of work. Moreover, the laboratory directions for "cryptogams" demand an unusually large amount of material and a thoroughly prepared teacher—the very things which have caused "the best of the more recent text-books to be characterized as too difficult and comprehensive for practical use in an elementary course." That is to say, the teacher must be adequately trained in botany and capable of selecting even from Mr. Leavitt's book. Neither the ignorant nor the slave will be able to use it.

In the absence of any discussion of alternation of generations until the ferns are reached, the relation of the two phases of the liverworts and mosses is left somewhat obscure. Heterospory and the seed habit are touched rather vaguely; indeed, when undertaking to elucidate the "relationship of cryptogams and phanerogams" suppositions are proposed regarding Selaginella which need not he imagined, because they are facts.

Throughout the book the author has retained a great deal of the formal Goethean morphology which characterized the *Lessons* and *Structural botany*. Another survival is to be seen in the maintenance of the division of plants into flowering and flowerless. The author has dropped into smaller type many of the sections which merely define the technical descriptive terms. The chapter treating of the flower, however, is still hardly more than an extended glossary.

We hazard a guess that the demands of the botanical department of Harvard University are more responsible for these features than the judgment of the author. It seems a pity to attempt to galvanize the *Lessons* into a semblance of life again, the more because the book was not only the most popular and widely used, but the most useful text-book of its day; one whose admirable lucidity and directness may well be the envy of the text-book makers of a later generation. It earned for itself an honorable name and a secure place in memory, and should now be allowed to pass, albeit with something of the same regret and sense of loss as at the death of its loved and lamented author. The attempt to combine its method and the modern one is a mistake, as false in theory as it is likely to be futile in practice. Mr. Bergen recently attempted a similar feat in his *Foundations of botany*, offering the old in one hand and all varieties of the new in the other. Authors (perhaps we should say in this case departments of botany) ought to be content to adopt a method which seems to them best, maintain it consistently through the book, and offer it with the other books, written from a similar or a different standpoint, for the intelligent choice of teachers. The other course savors of the commercial rather than the scientific or educational.—C. R. B.

MINOR NOTICES.

EUG. WARMING[5] has published an account of the very peculiar floral structures of certain Brazilian Burmanniaceae discovered by Dr. A. Glaziou, including a description of two new genera (*Glaziocharis* and *Triscyphus*) by Taubet.—J. M. C.

O. A. FARWELL has published a catalogue of the flora (Pteridophytes and Spermatophytes) of Detroit, being a reprint, with additions, from the Eleventh Annual Report of the Commissioners of Parks and Boulevards. It contains a total of 885 species and varieties.—J. M. C.

THE REPORT of the State Botanist of New York for 1900 has just appeared. It contains descriptions of forty-five new species and varieties of fungi. A section on edible fungi describes sixteen forms, three of which are new. Most of the new and edible species are illustrated in the thirteen colored double plates.—J. M. C.

A NEW FASCICLE[6] of Urban's *Symbolae Antillanae* has appeared. The first part (pp. 1–13) is a continuation of the botanical bibliography of the West Indies. The second (pp. 14–158) is a very interesting and apparently complete series of biographical notes of botanists who have visited the West

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[5] WARMING, EUG., Sur quelques Burmanniacées recueillies au Bresil par le Dr. A. Glaziou. Bull. Acad. Roy. Sci. Danemark pp. 173–188. *pls. 3–4. figs. 1–6.* 1901.

[6] URBAN, IGNATIUS, Symbolae Antillanae seu fundamenta florae Indiae occidentalis. Vol. III. fasc. I. pp. 1–160. Leipzig: Gebrüder Borntraeger. 1902. *M* 9.